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WESTERN PACIFIC PELAGIC FISHERIES IN 1988

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INTRODUCTION

This report presents summary information on the current status of pelagic fisheries in American Samoa, Guam, Hawaii, and the Commonwealth of the Northern Mariana Islands (CNMI). The pelagic management unit species (PMUS) comprise various marlins and other billfish, mahimahi, ono (wahoo), and sharks, which are managed by a fishery management plan (FMP) prepared by the Western Pacific Regional Fishery Management Council (Council). Also included in this report is information on the major tuna species in the region. Information is presented on 1) the small-scale fisheries in American Samoa, Guam, and the CNMI for PMUS and tunas; 2) the by-catch of the foreign longline fisheries supporting tuna canneries in American Samoa; and 3) Hawaii's larger commercial fisheries for PMUS and tunas. All information is based on commercial landings. Although recreational and subsistence fisheries are important in the western Pacific and may comprise a larger percentage of the actual total landings of some pelagic species than the commercial catch, availability of these data is either limited (Guam) or nonexistent (American Samoa, Hawaii, and the CNMI).

This report serves as a "module" to an annual report on these fisheries that is prepared by the Council's PMUS Plan Monitoring Team. Information on the biological status of PMUS will be included in a separate module, which contains the scientific names of relevant species. This report provides only the common names for fishes. Most of the information for American Samoa, Guam, and the CNMI comes from the Western Pacific Fishery Information Network (WPACFIN) (Hamm and Quach 1989). Each of these areas has a separate module in the PMUS annual report, which discusses the fisheries much more fully. Data are presented in pounds throughout this report, which is the industry and local government standard in the western Pacific (1 pound is 0.45 kilogram; 1 kilogram is 2.2 pounds).

DOMESTIC PELAGIC FISHERIES OF AMERICAN SAMOA, GUAM, AND THE CNMI

The pelagic fisheries of American Samoa, Guam, and the CNMI continue to show substantial annual variability. Commercial landings are subject to a number of factors; central among these factors are the biological and environmental conditions, the development of domestic and export markets for locally caught fish, and alternative employment opportunities for fishermen. Guam has shown the most sustained increase in PMUS landings, whereas American Samoa and the CNMI have shown little growth in PMUS landings since 1982. Tuna landings from the latter two areas have grown since 1982, but Guam's landings have not. Data from WPACFIN reports for 1982-87 are summarized in Tables 1-3. Interpretation of trends (Fig. 1) should be made cautiously, according to the provisos raised in the original WPACFIN reference reports. Average prices for PMUS are relatively low in all three areas, except for Guam, where mahimahi, ono, and yellowfin tuna have become significant export species (Table 4).

FISHERIES SUPPORTING CANNERIES IN AMERICAN SAMOA

American Samoa has two canneries, which receive fish from three major sources: U.S. tuna purse seiners fishing for skipjack tuna (with a substantial by-catch of yellowfin tuna), U.S. albacore trollers fishing seasonally in the South Pacific, and foreign tuna longliners concentrating on albacore. Information on the PMUS by-catch of the foreign longline fishery is provided by the National Marine Fisheries Service (NMFS), which has a sampling program in American Samoa (Ito and Yamasaki 1988). The data are compiled by date of capture from voluntary logbooks carried by the foreign longline fishery. Date of capture rather than the date of landing is used to avoid disclosing confidential cannery information. Data are only available through 1987 because of the length of longline trips and data processing requirements.

In 1987, the foreign longline fleet based in American Samoa consisted of 128 vessels (326 trips). Most of the vessels were of Taiwanese and South Korean nationality with one vessel from Tonga. Twenty-five longliners (51 trips) also off-loaded a small proportion of their by-catch sashimi to the canneries. Most of the catch of the sashimi vessels was transshipped from American Samoa and sold as fresh-frozen fish.

Foreign longline landings increased from 29,300 metric tons (t) in 1986 to 37,800 t in 1987. Albacore comprised 72.4% of the catch in 1987, followed by yellowfin tuna (11.9%) and bigeye tuna (5.2%) (Table 5). Miscellaneous species represented 10.6% of the catch--PMUS comprised 6.7% of total catch (Fig. 2). Blue marlin was the largest individual component of the by-catch equaling 5.0% of the total catch. Other PMUS were negligible. A substantial domestic industry has developed in American Samoa; various PMUS and other species landed by the foreign longliners but not destined for the canneries are filleted and exported to Hawaii and the U.S. mainland.

Tuna are transshipped through Guam and Tinian in the CNMI by U.S. and foreign purse seine vessels and by foreign longline tuna vessels, but up-to-date data are not available on these operations. At various times, problems have arisen from the domestic sales of the PMUS by-catch from these vessels, but the extent of these sales is not known.

HAWAII'S PELAGIC FISHERIES

The recent, dramatic changes in Hawaii's pelagic fisheries continued in 1988 with the explosion of interest in tuna longlining. The number of tuna longliners operating in Hawaii rose from 37 in 1985 to 50 in 1988, with more arriving throughout the first half of 1989 (the figure stood at 65 at the end of the first quarter). Most of these vessels are targeting bigeye tuna with an eye toward the Japanese export market, but some vessels are targeting PMUS, e.g., swordfish. Coincident with the expansion of the domestic longline fleet, local wholesale fish distributors have begun experimenting with the transshipment and sale of fresh fish, which are caught by foreign longline fishing vessels operating in the waters around

Hawaii. Together these two developments have raised the public's awareness of Hawaii's pelagic fisheries, with substantial concern on the part of local recreational and sportfishers, and small-scale commercial fishers.

Data Sources and Problems

Our estimates of Hawaii's pelagic landings are derived from the NMFS shoreside monitoring program, which samples fish sold in Hawaii's fresh fish markets. From this monitoring program, it is possible to estimate commercial landings of many pelagic species--especially landings by the major commercial fleets--independently of the State of Hawaii's commercial landings reporting system. However, the monitoring program covers only a portion of the entire market (with most information derived from Oahu and the Big Island) and consists of a nonrandom sample, not a census, of these markets. The sample data are "scaled" to market-wide quantities through raising factors, which range from 1.1 to 2.0. These factors were applied consistently to the 2 years (1987 and 1988) for which we have complete pelagic data. Even though the market structure has been changing in this period, we do not have a recent statistical base on which to verify our raising factors. Therefore, these estimates must be considered provisional and used with care.

Data from the Hawaii Division of Aquatic Resources (HDAR) for commercial fish landings were unavailable for 1988 at the time of this report's preparation. There is considerable concern that the HDAR data severely undercount Hawaii's landings, as can be seen by comparing HDAR records of total longline landings of PMUS for 1987 (350,000 pounds) with our estimate (3.3 million pounds) or the HDAR figure for bigeye tuna (204,400 pounds) with our estimate (1.9 million pounds). In neither case is there any question of our raising factors being excessive.

Estimates

Our estimate of Hawaii's pelagic landings in 1988 is outlined in Table 6. We estimate that PMUS landings reached 3.8 million pounds in 1988, valued at $5.8 million (Fig. 3). This represents a 15% increase in landings (by weight) but, because of lower prices and a change in species composition (Table 7), only a 2% increase in value. (Apparently 1988 was a poor year for mahimahi landings in Hawaii.) Tuna landings increased 31% to 12 million pounds valued at $23.2 million (up 32% in value); excluding skipjack tuna, landings increased 39% or 7.7 million pounds. Bigeye tuna, the focus of the longline tuna fleet expansion, increased in landings by 60%.

In terms of fleet activity, longline fishing grew substantially in 1988, with longline landings (including tunas) up 73% from our 1987 estimate (Table 8). We estimate that longline trips increased from 435 in 1987 to 627 in 1988. Landings from the trolling and handline fisheries for tunas were static (Fig. 4), falling 4% in 1988. The decline in these fisheries was due to a decline in mahimahi landings (Fig. 5). The majority

of the PMUS were landed by vessels using longline and trolling gear (Fig. 6A), whereas the majority of the tunas were landed by longline and other types of gear (Fig. 6B). Landings by other types of gear include those from distant-water trollers, the aku (skipjack tuna) boat fleet, and the various fleets in the Northwestern Hawaiian Islands (primarily bottom fish and lobster). Gear shares for individual PMUS species and tunas are shown in Figures 6C and 6D, respectively.

Trolling gear caught the vast majority of the blue marlin and mahimahi, whereas longline gear caught most of the striped marlin in 1988. Similar differences existed for yellowfin and bigeye tunas. Species composition of catches by trolling and handline gear is estimated using State of Hawaii gear shares for 1987, because the NMFS sampling program does not provide a good basis for distinguishing between these two gear types. Vessels using longline gear caught mostly tunas (bigeye, yellowfin, and albacore) while handliners concentrated on yellowfin tuna (Fig. 7). Trollers landed a wide variety of species, with yellowfin tuna and blue marlin being the largest components.

Prices for pelagic species in 1988 were not much different from those in 1987 (Fig. 8). In general, the trolling and handline prices were better for the PMUS group, while longline landings claimed the higher prices for tunas (Table 9).

HAWAII'S IMPORTS

The NMFS Southwest Region Market News Service provides annual summaries of Hawaii's imports of fishery products. The data are compiled from the inspection program of the U.S. Food and Drug Administration. These data provide a more complete species breakdown of fishery data than do the data from U.S. Customs, but they are incomplete because not all lots are sampled or are available for tabulation. These data do not include imported seafood products that are shipped to Hawaii from other U.S. Customs districts, such as Los Angeles. Some imports may be transshipped from Hawaii to other U.S. locations.

Imports of PMUS to Hawaii were slightly higher in 1988 (3.15 million pounds, independent of product form) than in 1987, but less than in 1985 and 1986 (Fig. 9). Most of these imports were frozen mahimahi fillets; however, in 1988, over 500,000 pounds of ono (wahoo) in the round were imported to Hawaii in 1988 (Table 10).

The NMFS Market News does not provide prices for imported seafood. However, if the NMFS wholesale seafood market monitoring program's average price for imported pelagic species (in the round) is applied, then the 1988 imports of round-weight PMUS would be worth approximately $1.5 million and tuna imports would be $2.7 million. The value of filleted and other product forms is not known.

RESEARCH

Two studies were reported on the fishing operations, markets, and economics of pelagic species in 1989. One is a study of the operations and economics of small boat fishing in American Samoa, Guam, and the CNMI. The study is based on a cooperative survey facilitated by the Council and conducted by agencies in each region. The data have been compiled into a preliminary report (Kasaoka 1989), and will be analyzed later this year. The second study (Kawamoto et al. 1989) conducted by NMFS Honolulu Laboratory researchers, is on the operations of Hawaii's longline fishing fleet in 1987-88. It outlines the history of the longline fishery, describes the types of gear used historically and recently, and provides data on fleet activity and landings obtained from the NMFS shoreside monitoring program.

Two planned studies concerning pelagic fisheries did not get off the ground in 1988. First, a survey of Hawaii's wholesale and retail seafood market channels was expected to be conducted this year through the NMFS Honolulu Laboratory. However, because of delays in contractual and survey approvals, the project has been postponed until 1990. Results from this survey should reveal how Hawaii's seafood market has changed over the past 10 years. Second, the Council and the HDAR, with the assistance of NMFS, have been working on the design for a survey of small boat fisheries in Hawaii to provide better estimates of part-time commercial, recreational, and subsistence catches. The HDAR has funds from NMFS to field this survey for 1 year, which is expected to begin early in 1990. Results from this survey should provide a better idea of the relative importance of the commercial data used in existing status reports or pelagic species.

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Table 1.--Pelagic species commercial landings in American Samoa, 1982-87 (from WPACFIN data (Hamm and Quach 1989)).

Common name	Pounds landed							Revenue (US$) 1987	
	5-year average 1982-86	1982	1983	1984	1985	1986	1987	Total	Price/ pound
Pelagic management unit species (PMUS)									
Swordfish	33	0	0	0	163	0	0		NA
Blue marlin	2,807	315	1,083	5,675	2,790	4,171	233	186	0.80
Sailfish	808	127	74	989	2,744	107	1,153	1,153	1.00
Marlin	0		0	0	0	0	0		NA
Marlins	3,648	442	1,157	6,664	5,697	4,278	1,386	1,339	0.97
Sharks	565	45	293	723	1,026	738	0	0	NA
Rainbow runner	746	24	655	2,305	558	190	19	15	0.79
Wahoo	1,410	113	632	1,637	2,357	2,311	1,419	1,988	1.40
Mahimahi	4,355	745	1,442	1,807	7,394	10,388	2,445	3,023	1.24
Total PMUS	10,724	1,369	4,179	13,136	17,032	17,905	5,269	6,365	1.21
Tunas									
Skipjack tuna	68,040	15,005	54,841	114,926	35,236	120,194	104,974	74,325	0.71
Dogtooth tuna	1,393	170	917	2,627	974	2,278	1,340	1,337	1.00
Yellowfin tuna	33,698	6,933	18,956	58,609	35,707	48,283	30,522	39,207	1.28
Bigeye tuna	706	0	0	0	3,528	0	0	0	NA
Kawakawa	480	109	368	769	1,125	29	127	127	1.00
Albacore	14,031		10,904	20,390	24,831	0	0	0	NA
Tuna (other)	4	18	0	0	0	0	0	0	NA
Total tuna	115,545	22,235	85,986	197,321	101,401	170,784	136,963	114,996	0.84

Table 2.--Pelagic species landings in Guam, 1982-87 (from Hamm and Quach 1989).

Common name	Pounds landed							Revenue (US$) 1987	
	5-year average 1982-86	1982	1983	1984	1985	1986	1987	Total	Price/ pound
Pelagic management unit species (PMUS)									
Swordfish	0	0	0	0	0	0	0	0	NA
Blue marlin	0	0	0	0	0	0	0	0	NA
Sailfish	397	244	0	426	354	959	1,247	1,221	0.98
Marlin	20,541	13,634	654	29,905	20,581	37,930	34,779	29,612	0.85
Marlins	20,937	13,878	654	30,331	20,935	38,889	36,026	30,833	0.86
Sharks	528	1,130	257	521	237	493	862	431	0.50
Rainbow runner	549	398	68	584	816	878	510	771	1.51
Wahoo	32,617	14,479	3,585	40,969	65,040	39,012	45,548	79,285	1.74
Mahimahi	35,409	34,118	13,518	20,336	45,828	63,244	46,886	74,610	1.59
Total PMUS	90,040	164,003	18,082	92,741	132,856	142,516	29,832	185,930	1.43
Tunas									
Skipjack tuna	28,247	30,384	2,658	57,328	26,724	24,143	17,137	17,085	1.00
Dogtooth tuna	3,452	2,354	165	3,438	5,980	5,322	2,521	3,321	1.32
Yellowfin tuna	28,732	30,722	1,328	39,441	44,395	27,775	40,466	69,028	1.71
Bigeye tuna	0	0	0	0	0	0	0	0	NA
Kawakawa	1	0	0	0	5	0	0	0	NA
Albacore	0	0	0	0	0	0	0	0	NA
Tuna (other)	91	387	30	40	0	0	0	0	NA
Total tuna	60,524	63,847	4,181	100,247	77,104	57,240	60,124	89,434	1.49

Table 3.--Pelagic species landings in the Commonwealth of the Northern Mariana Islands, 1982-87 (from Hamm and Quach 1989).

Common name	Pounds landed							Revenue (US$) 1987	
	5-year average 1982-86	1982	1983	1984	1985	1986	1987	Total	Price/ pound
Pelagic management unit species (PMUS)									
Swordfish	0	0	0	0	0	0	0	0	NA
Blue marlin	0	0	0	0	0	0	0	0	NA
Sailfish	50	0	47		61	91	67	107	1.60
Marlin	1,577	10	3,029	1,235	1,488	2,123	1,968	2,230	1.13
Marlins	1,617	10	3,076	1,235	1,549	2,214	2,035	2,337	1.15
Sharks	30	30							NA
Rainbow runner	1,130	3,136	818	527	516	654	526	683	1.30
Wahoo	9,250	6,123	7,008	11,269	14,600	7,250	10,722	13,581	1.27
Mahimahi	10,861	12,468	11,150	6,090	10,363	14,236	7,601	9,955	1.31
Total PMUS	22,864	21,767	22,052	19,121	27,028	24,354	20,884	26,556	1.27
Tunas									
Skipjack tuna	158,004	65,220	146,729	232,674	141,909	203,489	129,203	145,197	1.12
Dogtooth tuna	3,253	6,104	1,846	2,627	2,590	3,099	5,106	6,457	1.26
Yellowfin tuna	12,930	8,456	17,024	15,664	9,972	13,533	8,362	11,436	1.37
Bigeye	0	0	0	0	0	0	0	0	NA
Kawakawa	0	0	0	0	0	0	0	0	NA
Albacore	0	0	0	0	0	0	0	0	NA
Tuna (other)	81	405	0	0	0	0	0	0	NA
Total tuna	174,268	80,185	165,599	250,965	154,471	220,121	142,671	163,090	1.14

Table 4.--Pelagic species prices in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI), 1987 (from Hamm and Quach 1989).

Common name	Price (US$) per pound		
	American Samoa	Guam	CNMI
Marlins	0.97	0.86	1.15
Mahimahi	1.24	1.59	1.31
Ono (wahoo)	1.40	1.74	1.27
Total PMUS	1.21	1.43	1.27
Skipjack tuna	0.71	1.00	1.12
Yellowfin tuna	1.28	1.71	1.37
Total tunas	0.84	1.49	1.14

Table 5.--American Samoa foreign longline fleet species composition, 1982-87. Data are from the NMFS monitoring program in American Samoa, based on date of capture.

Common name	Percent of total						
	5-year average 1982-86	1982	1983	1984	1985	1986	1987
Albacore	70.42	70.4	66.8	61.7	71.6	81.6	72.4
Yellowfin tuna	15.74	12.7	18.1	21.7	14.7	11.5	11.9
Bigeye tuna	8.84	9.6	10.9	10.8	7.9	5	5.2
Billfish	2.84	4.7	2.8	2.7	4	0	6.7
Other	2.16	2.7	1.5	3	1.7	1.9	3.8
Total	100.00	100.1	100.1	99.9	99.9	100.00	100.0

Table 6.--Hawaii's pelagic species market, 1987-88. Data are estimates from NMFS shoreside monitoring. Imports do not include transshipments from U.S. mainland.

Source	Landings (1,000's pounds)		Market revenue (US$1,000's)	
	1987	1988	1987	1988
Pelagic management unit species (PMUS)				
Hawaii landings	3,330	3,840	5,710	5,820
Imports (round)	690	530	1,690	1,470
Total PMUS	4,020	4,370	7,400	7,290
Tunas				
Hawaii landings	9,300	12,190	17,500	23,210
Imports (round)	960	950	1,834	2,730
Total tunas	10,260	13,140	19,334	25,940
Totals				
Total Hawaii pelagics	12,630	16,030	23,210	29,030
(excluding aku)	8,940	11,610	19,007	24,149
Total pelagic imports	1,650	1,480	3,524	4,200
Total	14,280	17,510	26,734	33,230

Table 7.--Species composition and revenue of pelagic species landed in Hawaii, 1987-88. Estimates are based on the shoreside monitoring program of the National Marine Fisheries Service.

Common name	Landings by species (in 1,000 pounds)		Revenue (US$1,000's)	
	1987	1988	1987	1988
Pelagic management unit species (PMUS)				
Blue marlin	951	1,023	892	854
Striped marlin	691	1,349	947	1,472
Other billfish	208	342	523	473
Mahimahi	1,023	565	2,253	1,715
Ono (wahoo)	411	445	1,024	1,185
Other PMUS	47	120	68	124
Other pelagics (excluding tunas)	183	233	316	328
Total PMUS	3,331	3,844	5,707	5,823
Tunas				
Bigeye tuna	1,903	3,062	6,769	9,773
Yellowfin tuna	3,358	3,995	5,965	7,593
Albacore tuna	337	706	544	955
Skipjack tuna	3,694	4,422	4,203	4,881
Other tunas	12	7	22	8
Total tunas	9,304	12,192	17,503	23,210

Table 8.--Hawaii pelagic landings (in 1,000 pounds) by gear type, 1987-88. Estimates are based on the shoreside monitoring program of the National Marine Fisheries Service.

	1987 landings				1988 landings			
	Total	Longline	Troll and handline	Other	Total	Longline	Troll and handline	Other
Pelagic management unit species (PMUS)								
Blue marlin	951	112	836	3	1,023	226	794	3
Striped marlin	691	598	93	0	1,349	1,112	235	2
Other billfish	208	152	55	1	342	205	137	0
Mahimahi	1,023	46	956	21	565	39	518	8
Ono (wahoo)	411	53	265	93	445	90	247	108
Other PMUS	47	43	4	0	120	95	24	1
Other pelagics (excluding tunas)	183	182	1	0	233	224	8	1
								0
Total PMUS	3,331	1,004	2,209	118	3,844	1,767	1,955	122
Tunas								
Bigeye tuna	1,903	1,793	96	14	3,062	2,738	321	3
Yellowfin tuna	3,358	583	2,741	34	3,995	1,312	2,382	301
Albacore	337	328	9	0	706	678	27	1
Skipjack tuna	3,694	3	209	3,482	4,422	15	366	4,041
Other tunas	12	0	11	1	7	0	6	1
Total tunas	9,304	2,707	3,066	3,531	12,192	4,743	3,102	4,347

Table 9.--Hawaii pelagic species prices, 1988 (price in US$ per pound, ex-vessel). Market includes imports (in round) and landings by unspecified gear types.

Common name	Market	Longline	Trolling and handline
Pelagic management unit species (PMUS)			
Blue marlin	0.90	0.85	0.92
Striped marlin	1.11	1.08	1.23
Other billfish	1.41	2.02	0.45
Mahimahi	3.18	2.79	3.23
Ono (wahoo)	2.77	2.69	2.77
Other PMUS	1.05	1.08	0.87
Imports	1.12	NA	NA
Total PMUS	1.74	1.29	1.68
Tunas			
Bigeye tuna	3.23	3.35	1.94
Yellowfin tuna	2.05	2.50	1.64
Albacore	1.36	1.34	1.83
Skipjack tuna	1.11	0.75	1.21
Imports	2.87	NA	NA
Total tunas	2.00	2.82	1.62

Table 10.--Hawaii's fresh-frozen pelagic seafood imports in 1988, as compiled by the NMFS Market News.

Common name	Pelagic imports (in pounds)		
	Round	Fillet	Total
Pelagic management unit species (PMUS)			
Mahimahi	8,963	2,618,728	2,627,691
Shark	351		351
Swordfish	1,290		1,290
Wahoo	520,899		520,899
Total PMUS	531,503	2,618,728	3,150,231
Tunas			
Bonito	10,404		10,404
Albacore	1,373		1,373
Bigeye tuna	159,971	15,000	174,971
Bluefin tuna	353		353
Skipjack tuna	217,735	72,023	289,758
Yellowfin tuna	555,962	125,940	681,901
Other	2,298		2,298
Total tunas	948,096	212,962	1,161,058

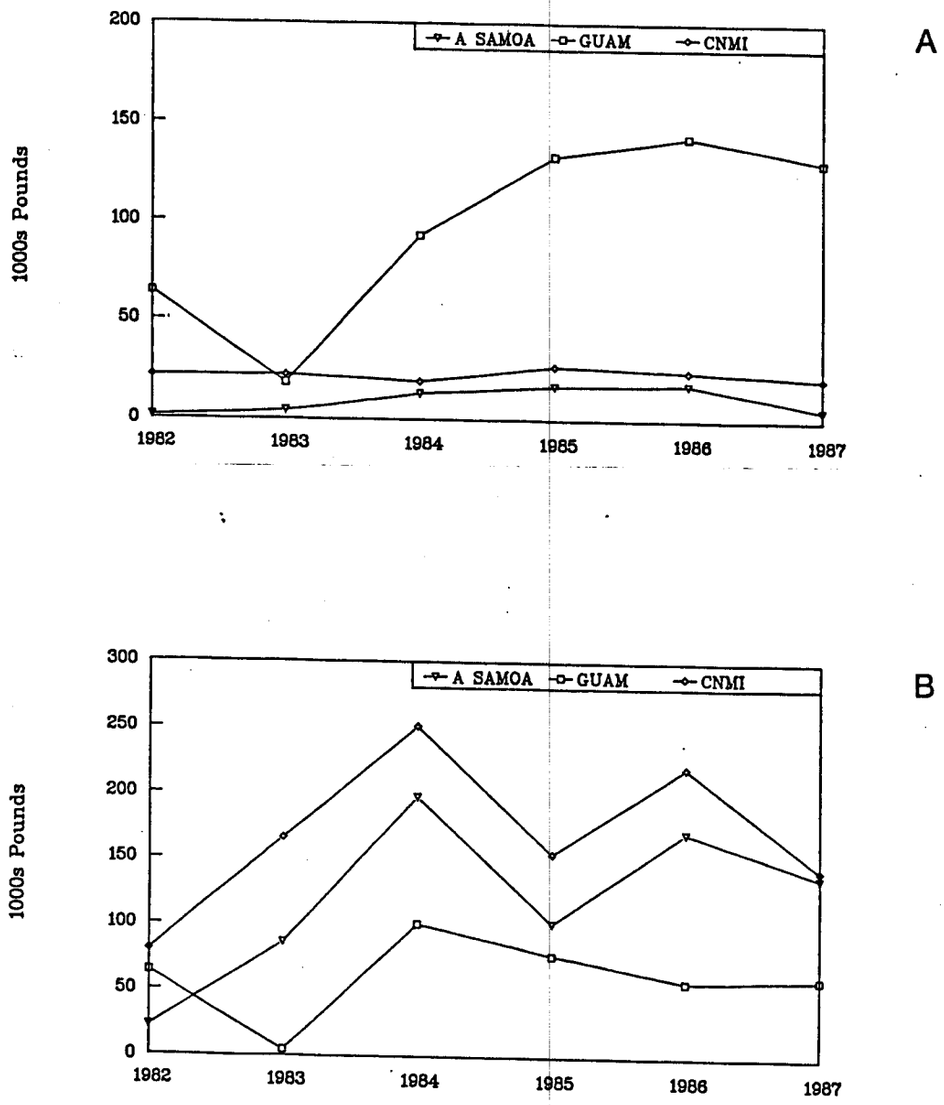


Figure 1.--Trends in 1982-87 commercial landings: (A) pelagic management unit species and (B) tunas in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (from Hamm and Quach 1989).

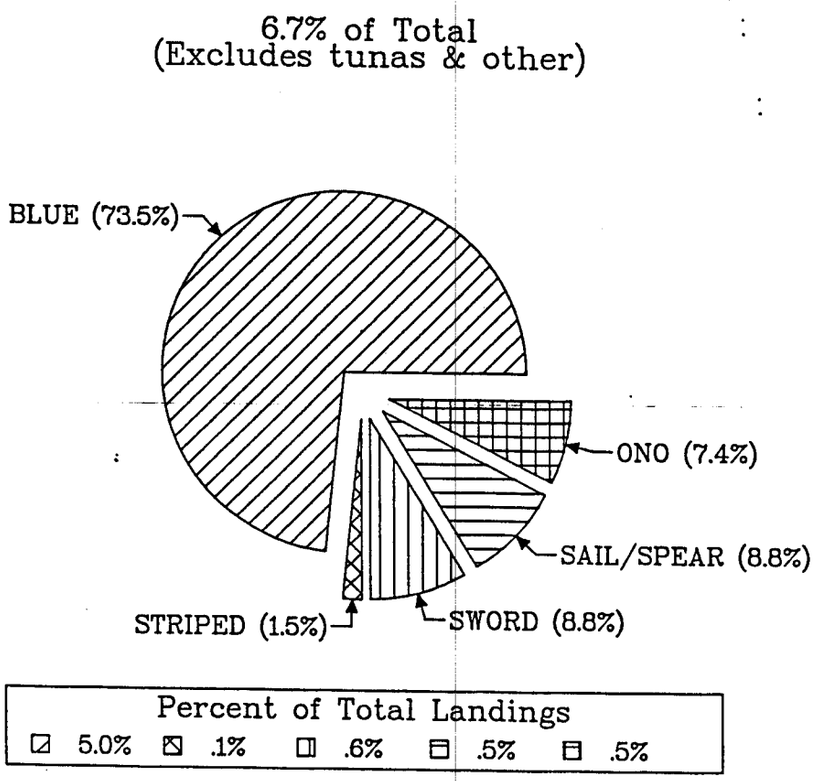
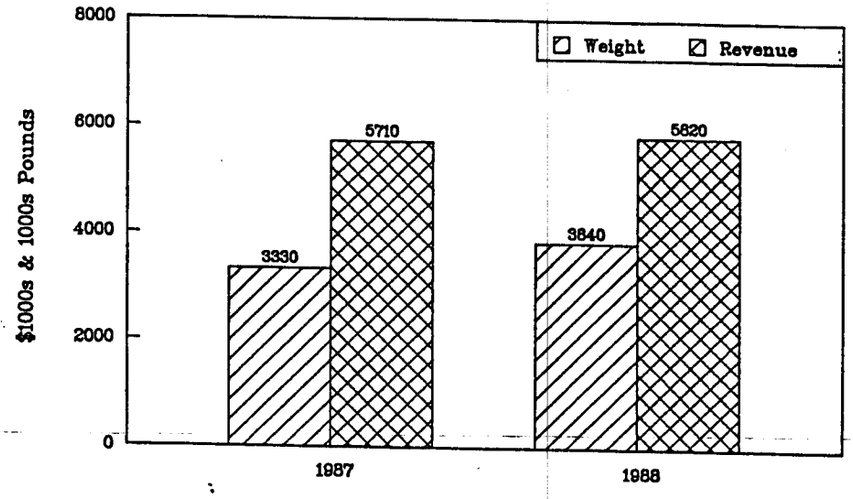


Figure 2.--Species composition of pelagic management unit species (percentage of PMUS and of total catch) in 1987, landed by the foreign longline fleet in American Samoa.



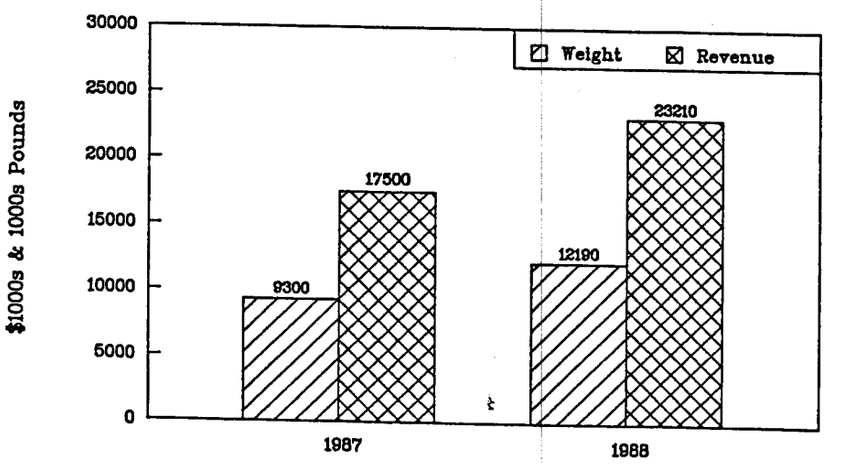


Figure 3.--Weight (in 1,000 pounds) and revenue (in US$1,000) of (A) pelagic management unit species and (B) tunas landed in Hawaii, 1987-88. (Data from shoreside monitoring.)

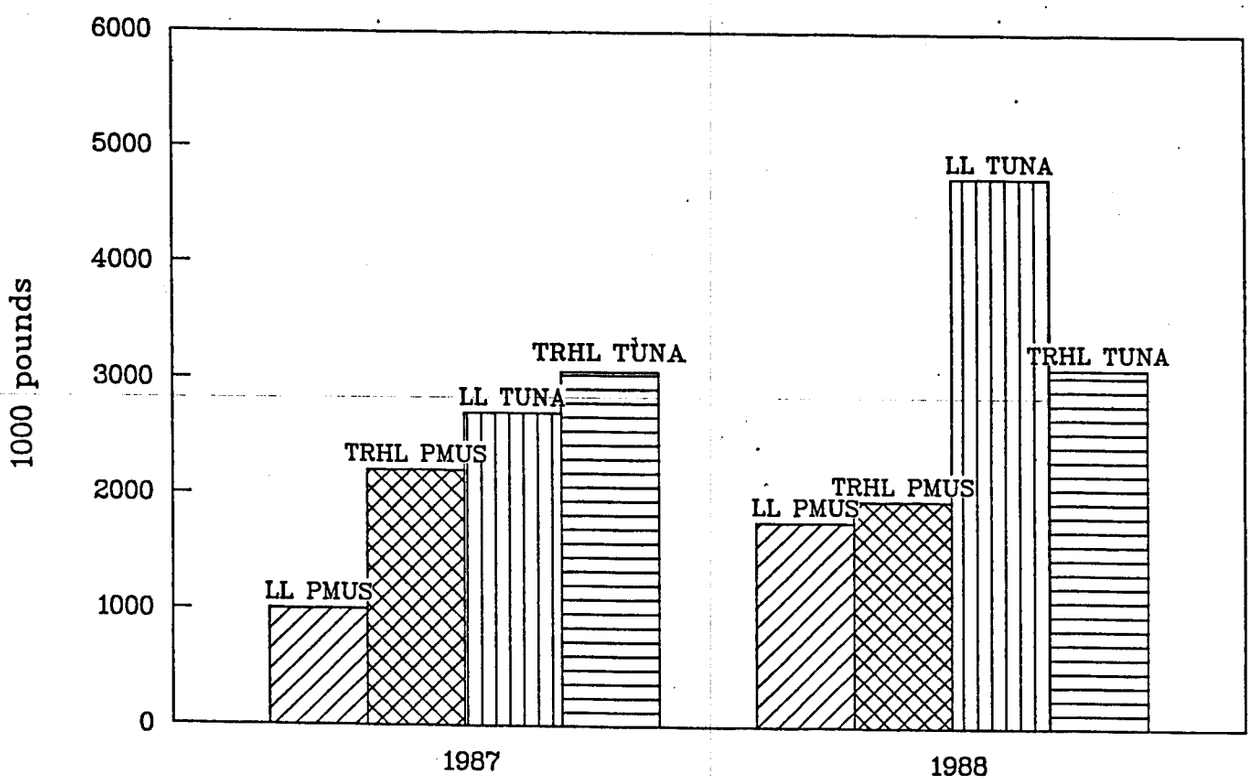


Figure 4.--Hawaii's pelagic landings by gear type, 1987-88 (excluding aku boats and Northwestern Hawaiian Islands) (LL = longline; TRHL = troll and handline).

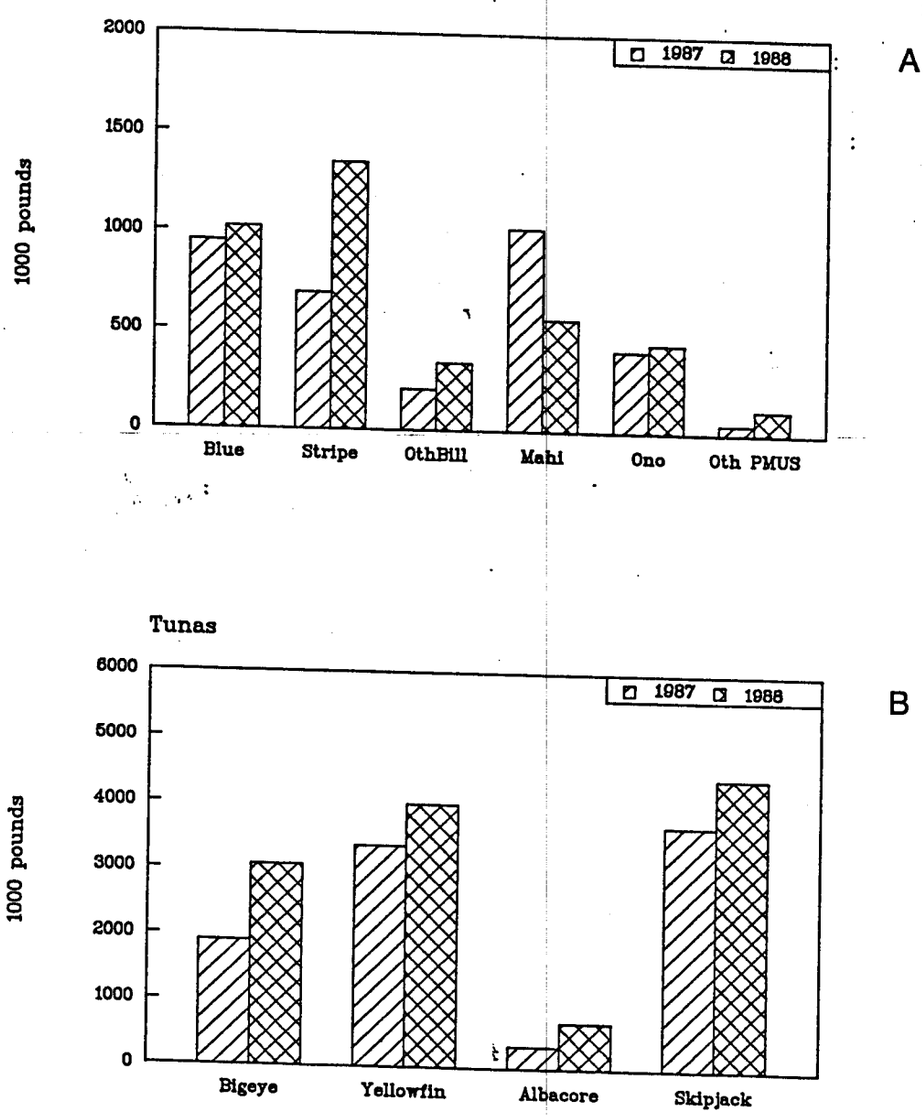


Figure 5.--Hawaii's pelagic species composition in 1987-88: (A) pelagic management unit species and (B) tunas.

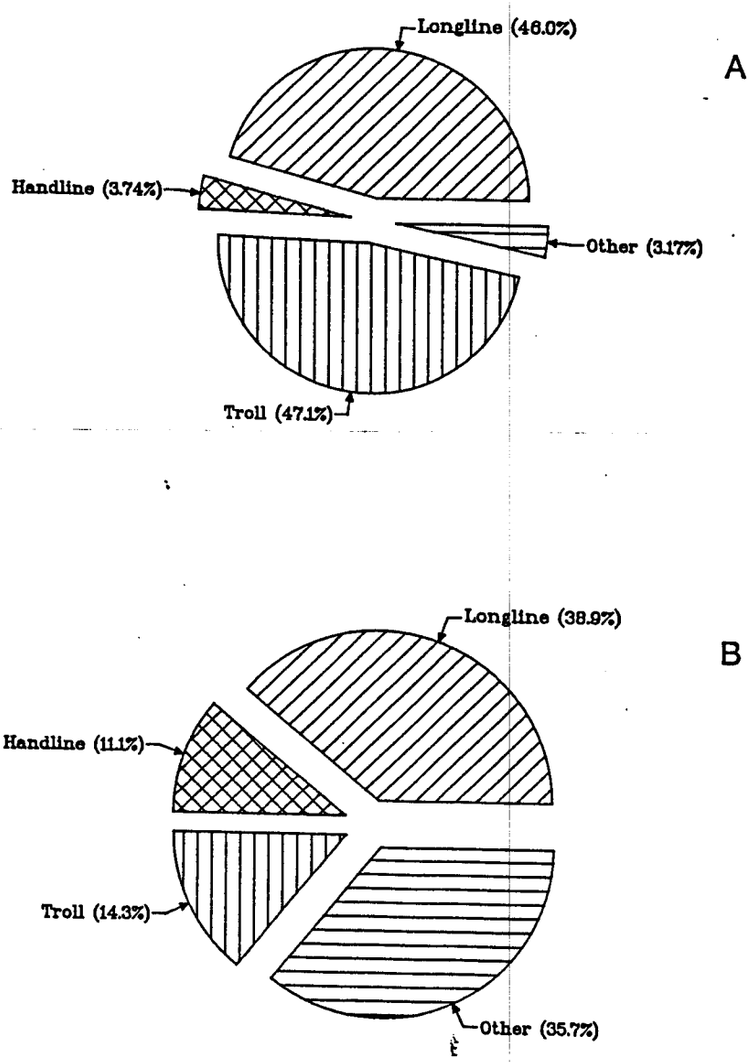
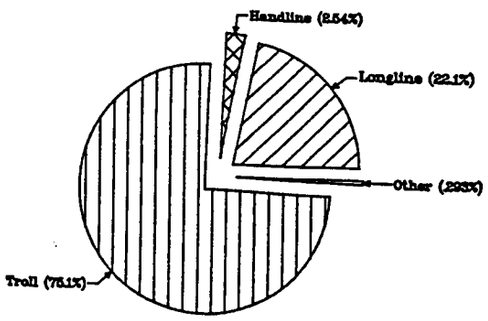


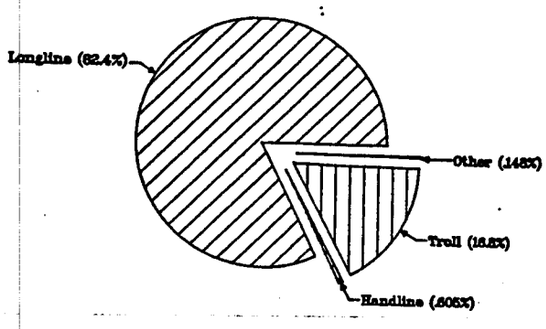
Figure 6.--Hawaii's pelagic gear shares in 1988: (A) pelagic management unit species, (B) tunas.

C

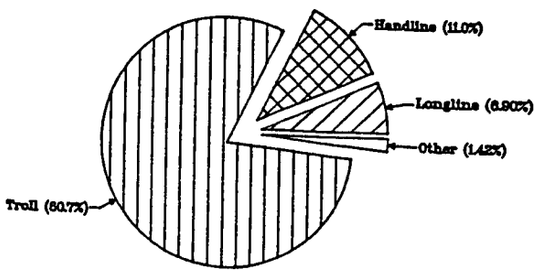
Blue Marlin, 1988



Striped Marlin, 1988



Mahimahi, 1988



Ono (wahoo), 1988

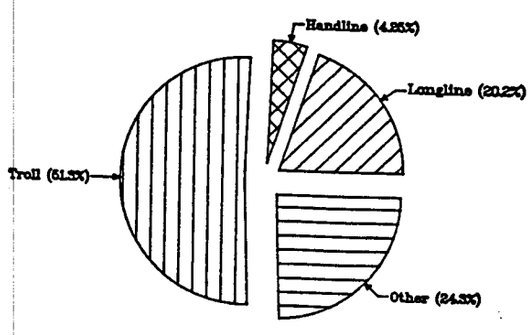
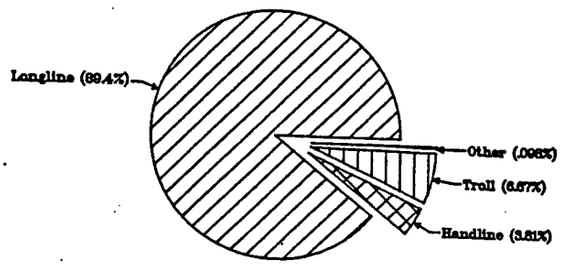


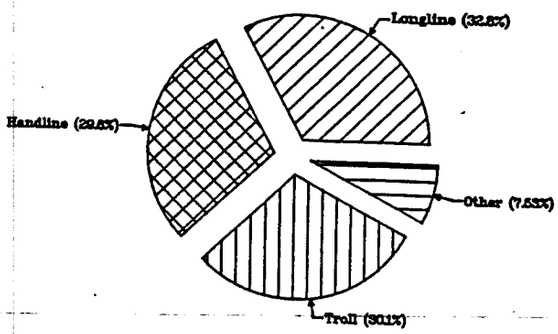
Figure 6.--Continued. (C) Individual PMUS.

D

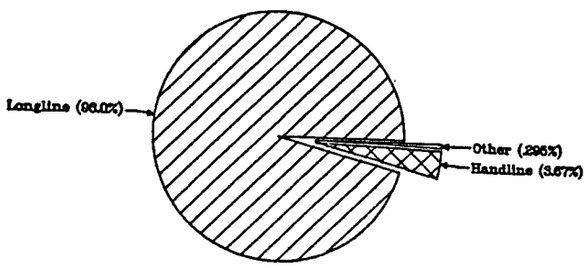
Bigeye tuna, 1988



Yellowfin tuna, 1988



Albacore tuna, 1988



Skipjack tuna, 1988

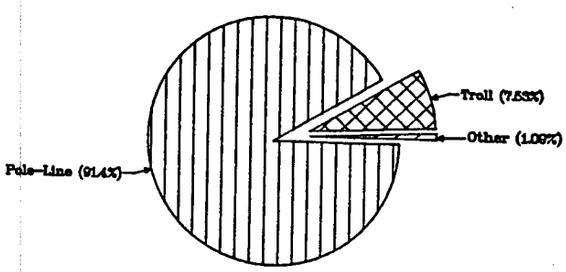


Figure 6.--Continued. (D) Individual tunas.

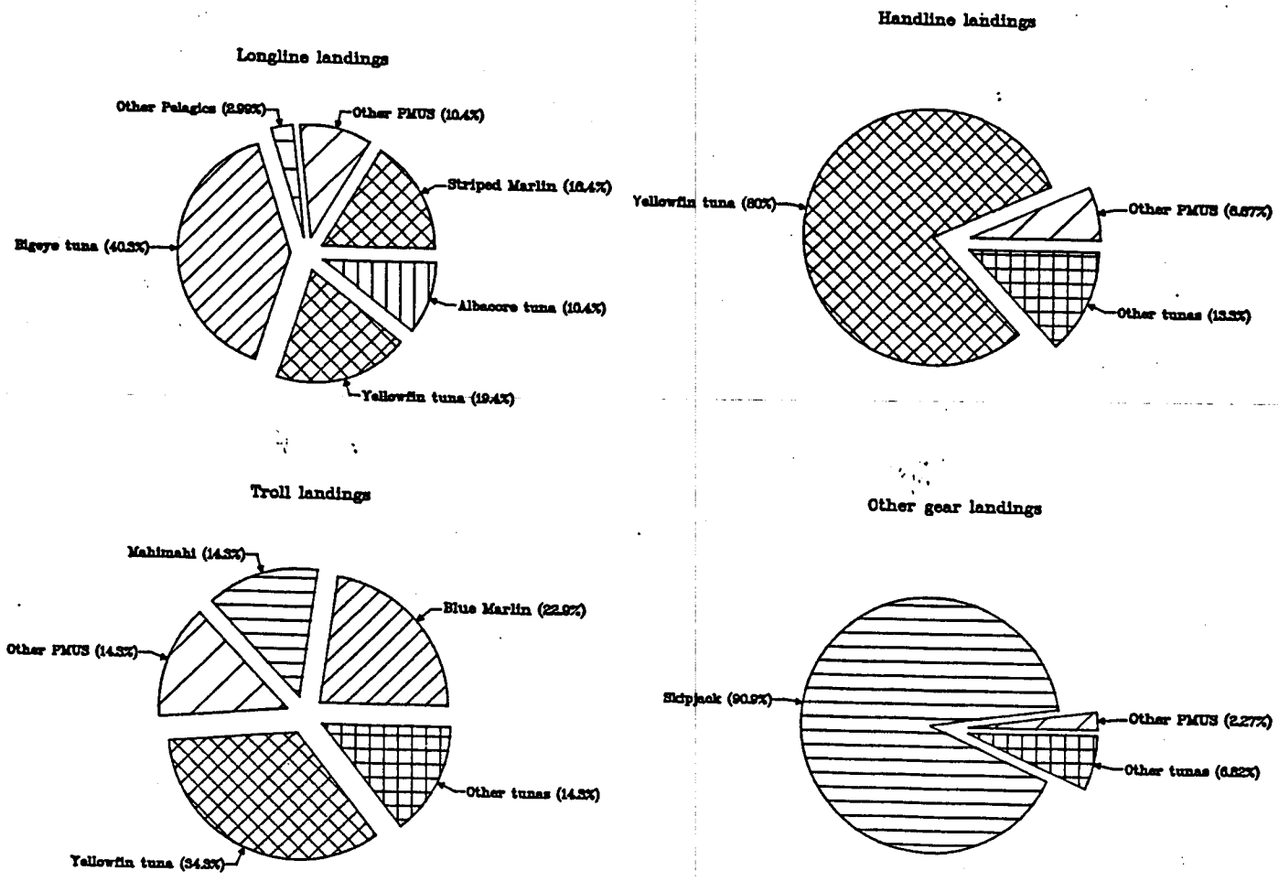


Figure 7.--Hawaii's gear shares in 1988 of primary pelagic species groups.

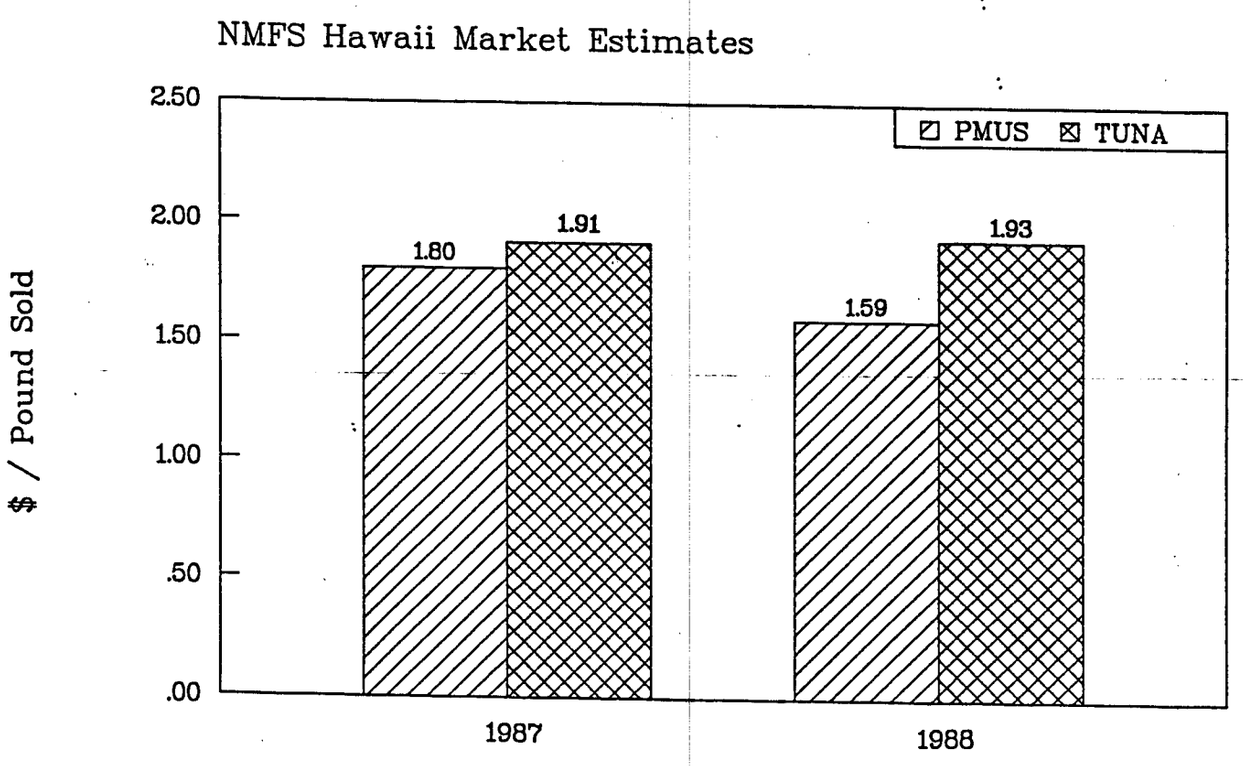


Figure 8.--Hawaii's pelagic prices in 1987-88.

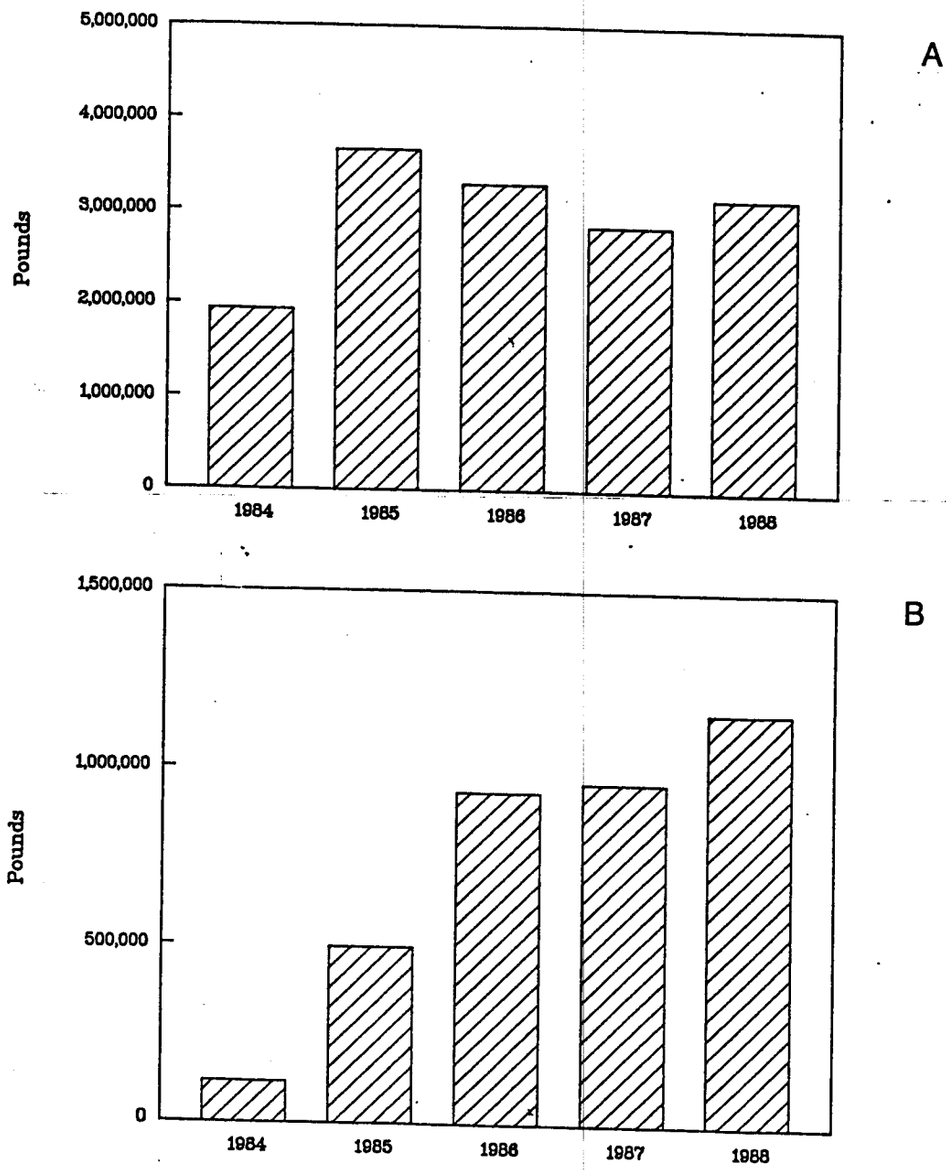


Figure 9.--Hawaii's imports (includes fillets and processed) in 1984-88: (A) pelagic management unit species and (B) tunas.